UW CPT plans for the next year

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General UW plans

1. Support NCEP&NCAR model development with LES (Peter Blossey)
   I. Provide GCSS case output
   II. Sensitivity studies as requested.
2. NCEP model development with Jongil, Ruiyu and Hualu
3. NCAR model development with Sungsu, Peter Caldwell and Cecile Hannay

UW collaboration in GFS

1. Implement GFS SCM cases with NCEP's new PBL/ShCu physics and assess results (Jennifer, Peter B, Ruiyu)
   I. Dry convective PBL
   II. DYCOMS Sc cases RF01 (no drizzle), RF02 (drizzle)
   III. BOMEX Cu case
   IV. Sc-Cu transition cases
2. Assess Sc-Cu transition in global GFS runs in climate mode (CAM WGNE metrics, vertical cross-sections) (Ruiyu, Chris)
3. Work in advisory role with NCEP and JPL scientists on GFS moist physics improvement, esp. shallow Cu and cloud fraction issues (Chris and others).

UW collaboration in CAM: Next 12 months

- Assess SCAM5 simulations of GCSS Sc-Cu transition cases (which have fixed cloud droplet conc.) (Sungsu, Chris)
- Take critical look at mixing/transport of aerosol and cloud droplet concentration in CAM5 by looking at climatological vertical profiles/cross sections (20S, GPCI) and few-timestep SCAM simulations (Sungsu, Chris, Cecile)
- Help solve problems with combining pdf cloud scheme with UW moist turbulence and shallow convection schemes (Peter C, Chris, Sungsu))
- Replace existing method of computing ShCu updraft properties (level 1+2 qt and sub-inversion theta-vl) by an EDMF-like approach more independent of the vertical grid (Sungsu, Chris)

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UW-NCAR collaboration: longer-term goals …

- Add a nonlocal term to UWMT downgradient treatment of heat, moisture fluxes in convective layers (Park, Bretherton), using a velocity scale proportional to the layer-mean TKE that is already computed in UWMT. This may require tweaking the diagnosis of the edge of convective layers, which is currently based on static stability.
- Combined mass-flux diffusion solver as in EDMF.
- Work with modified versions of UWShCu that also handle deep convection (Mapes/Neale; Hohenegger/ Bretherton/Park/Fletcher; Park)
- Double-Gaussian pdf for cloud fraction including Cu